

## CLAIMS

What is claimed is:

1. A method for reading information from an optical storage medium, comprising:  
providing a cache memory having multiple cache segments;  
receiving a request for information stored on the optical storage medium;  
determining whether the requested information is stored in one of the cache segments;  
retrieving the requested information from said one of the cache segments if the information is determined to be stored in the cache memory; and  
retrieving the requested information from the optical storage medium itself if the information is determined not to be stored in the cache memory.

2. The method according to claim 1, wherein the retrieved information pertains to a game application.

3. The method according to claim 1, wherein the cache memory includes a first group of at least one cache segment dedicated to handling a first type of information, and a second group of at least one cache segment dedicated to handling a second type of information.

4. The method according to claim 3, wherein the first type of information pertains to information that is designated for retrieval in a streaming transfer mode, and the second type of information pertains to information that is designated for retrieval in a bulk transfer mode.

1           5. The method according to claim 4, wherein the first type of information pertains  
2 to audio game information, and the second type of information pertains to game level  
3 load information.

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5           6. The method according to claim 1, wherein the determining of whether the  
6 requested information is stored in one of the cache segments includes determining  
7 whether the requested information is stored in a cache segment identified in hint  
8 information received from a host system.

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10          7. The method according to claim 1, when the requested information is retrieved  
11 from said one cache segment, the method further comprising:

12           moving a pointer associated with said one cache segment ahead to define free  
13 cache space;

14           pre-fetching information from the optical storage medium; and

15           filling the pre-fetched information into the free cache space of said one cache  
16 segment.

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18          8. The method according to claim 7, wherein the pre-fetching is performed at a  
19 time in which a drive mechanism is not otherwise engaged performing other tasks.

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21          9. The method according to claim 7, wherein the filling proceeds in circular  
22 manner by wrapping around from an end of said one cache segment to a beginning of  
23 said one cache segment.

1           10. The method according to claim 1, when the requested information is retrieved  
2 from the optical storage medium, the method further comprising:

3           determining which one of the cache segments should receive the requested  
4 information based on an eviction algorithm;

5           flushing the determined cache segment of its current contents; and

6           storing the information retrieved from the optical storage medium in the  
7 determined cache segment.

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9           11. The method according to claim 10, wherein the eviction algorithm determines  
10 the cache segment to receive the requested information by identifying the cache segment  
11 which has been least recently used.

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13           12. The method according to claim 10, wherein the eviction algorithm determines  
14 the cache segment to receive the requested information by identifying the cache segment  
15 which has been least frequently used.

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17           13. A computer readable medium including machine readable instructions for  
18 implementing each of the receiving, determining, retrieving information from the cache  
19 memory, and retrieving information from the optical storage medium of claim 1.

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21           14. An apparatus for reading information from an optical storage medium,  
22 comprising:

23           a cache memory having multiple cache segments;

24           cache management logic, including:  
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1                   logic configured to receive a request for information stored on the optical  
2 storage medium;

3                   logic configured to determine whether the requested information is stored  
4 in one of the cache segments;

5                   logic configured to retrieve the requested information from said one of the  
6 cache segments if the information is determined to be stored in the cache  
7 memory; and

8                   logic configured to retrieve the requested information from the optical  
9 storage medium itself if the information is determined not to be stored in the  
10 cache memory.

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12           15. The apparatus according to claim 14, wherein the retrieved information  
13 pertains to a game application.

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15           16. The apparatus according to claim 14, wherein the cache memory includes a  
16 first group of at least one cache segment dedicated to handling a first type of information,  
17 and a second group of at least one cache segment dedicated to handling a second type of  
18 information.

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20           17. The apparatus according to claim 16, wherein the first type of information  
21 pertains to information that is designated for retrieval in a streaming transfer mode, and  
22 the second type of information pertains to information that is designated for retrieval in a  
23 bulk transfer mode.

1           18. The apparatus according to claim 17, wherein the first type of information  
2           pertains to audio game information, and the second type of information pertains to game  
3           level load information.

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5           19. The apparatus according to claim 14, wherein the logic for determining is  
6           configured to determine whether the requested information is stored in a cache segment  
7           identified in hint information received from a host system.

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9           20. The apparatus according to claim 14, wherein the logic for retrieving the  
10          requested information from said one cache segment further comprises:

11          logic configured to move a pointer associated with said one cache segment ahead  
12          to define free cache space;

13          logic configured to pre-fetch information from the optical storage medium; and

14          logic configured to store the pre-fetched information in the free cache space of  
15          said one cache segment.

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17          21. The apparatus according to claim 20, wherein the logic for pre-fetching is  
18          configured to operate at a time in which a drive mechanism is not otherwise engaged  
19          performing other tasks.

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21          22. The apparatus according to claim 20, wherein the logic for filling is  
22          configured to fill said one cache segment in a circular manner by wrapping around from  
23          an end of said one cache segment to a beginning of said one cache segment.

1           23. The apparatus according to claim 14, wherein the logic for retrieving the  
2 requested information from the optical storage medium further comprises:

3           logic configured to determine which one of the cache segments should receive the  
4 requested information based on an eviction algorithm;

5           logic configured to flush the determined cache segment of its current contents;  
6 and

7           logic configured to store the information retrieved from the optical storage  
8 medium in the determined cache segment.

9  
10          24. The apparatus according to claim 23, wherein the eviction algorithm  
11 determines the cache segment to receive the requested information by identifying the  
12 cache segment which has been least recently used.

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14          25. The apparatus according to claim 23, wherein the eviction algorithm  
15 determines the cache segment to receive the requested information by identifying the  
16 cache segment which has been least frequently used.

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18          26. A computer readable medium including machine readable information for  
19 implementing the cache memory and each of the logic recited in claim 14.

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21          27. A method for reading information from a storage medium, comprising:  
22          providing a cache memory having multiple cache segments, wherein the cache  
23 memory includes a first group of at least one cache segment dedicated to handling a first  
24 type of information designated for retrieval in a streaming transfer mode, and a second  
25

1 group of at least one cache segment dedicated to handling a second type of information  
2 designated for retrieval in a bulk transfer mode;

3 receiving a request for information stored on the storage medium;

4 determining whether the requested information is stored in one of the groups of  
5 cache segments;

6 retrieving the requested information from said one of the groups of cache  
7 segments if the information is determined to be stored in the cache memory; and

8 retrieving the requested information from the storage medium itself if the  
9 information is determined not to be stored in the cache memory.

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11 28. The method according to claim 27, wherein the first type of information  
12 pertains to audio game information, and the second type of information pertains to game  
13 level load information.

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15 29. The method according to claim 27, wherein the determining whether the  
16 requested information is stored in one of the groups of cache segments includes  
17 determining whether the requested information is stored in a cache segment identified in  
18 hint information received from a host system.

19  
20 30. A computer readable medium including machine readable instructions for  
21 implementing each of the receiving, determining, retrieving information from the cache  
22 memory, and retrieving information from the storage medium of claim 27.

23  
24 31. A method for reading information from a storage medium, comprising:  
25 providing a cache memory;

1 receiving a request for information stored on the storage medium;  
2 determining whether the requested information is stored in the cache memory;  
3 retrieving the requested information from the cache memory if the information is  
4 determined to be stored in the cache memory, including:

5 moving a pointer associated with the cache memory ahead to  
6 define free cache space;

7 pre-fetching information from the storage medium; and

8 filling the pre-fetched information in the free cache space of the  
9 cache memory; and

10 retrieving the requested information from the storage medium itself if the  
11 information is determined not to be stored in the cache memory.

12  
13 32. The method according to claim 31, wherein the retrieved information pertains  
14 to a game application.

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16 33. The method according to claim 31, wherein the pre-fetching is performed at a  
17 time in which a drive mechanism is not otherwise engaged performing other tasks.

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19 34. The method according to claim 31, wherein the filling proceeds in circular  
20 manner by wrapping around from an end of the cache memory to a beginning of the  
21 cache memory.

22  
23 35. The method according to claim 31, wherein the storage medium is an optical  
24 storage medium.



1           36. A computer readable medium including machine readable instructions for  
2 implementing each of the receiving, determining, retrieving information from the cache  
3 memory, and retrieving information from the storage medium of claim 31.

4  
5           37. An apparatus for reading information from a storage medium, comprising:  
6           a cache memory having multiple cache segments, wherein the cache memory  
7 includes a first group of at least one cache segment dedicated to handling a first type of  
8 information designated for retrieval in a streaming transfer mode, and a second group of  
9 at least one cache segment dedicated to handling a second type of information designated  
10 for retrieval in a bulk transfer mode;

11           cache management logic, including:

12                   logic configured to receive a request for information stored on the  
13 storage medium;

14                   logic configured to determine whether the requested information is  
15 stored in one of the groups of cache segments;

16                   logic configured to retrieve the requested information from said  
17 one of the groups of cache segments if the information is determined to be  
18 stored in the cache memory; and

19                   logic configured to retrieve the requested information from the  
20 storage medium itself if the information is determined not to be stored in  
21 the cache memory.

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23           38. The apparatus according to claim 37, wherein the first type of information  
24 pertains to audio game information, and the second type of information pertains to game  
25 level load information.

1  
2 39. The apparatus according to claim 37, wherein the logic for determining is  
3 configured to determine whether the requested information is stored in a cache segment  
4 identified in hint information received from a host system.

5  
6 40. A computer readable medium including machine readable information for  
7 implementing the cache memory and each of the logic recited in claim 37.

8  
9 41. An apparatus for reading information from a storage medium, comprising:  
10 a cache memory;  
11 cache management logic, including:

12 logic configured to receive a request for information stored on the  
13 storage medium;

14 logic configured to determine whether the requested information is  
15 stored in the cache memory;

16 logic configured to retrieve the requested information from the  
17 cache memory if the information is determined to be stored in the cache  
18 memory, including:

19 logic configured to move a pointer associated with the  
20 cache memory ahead to define free cache space;

21 logic configured to pre-fetch information from the storage  
22 medium; and

23 logic configured to fill the pre-fetched information in the  
24 free cache space of the cache memory; and  
25

1 logic configured to retrieve the requested information from the storage medium  
2 itself if the information is determined not to be stored in the cache memory.  
3

4 42. The apparatus according to claim 41, wherein the retrieved information  
5 pertains to a game application.  
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7 43. The apparatus according to claim 41, wherein the logic for pre-fetching is  
8 configured to perform its operation at a time in which a drive mechanism is not otherwise  
9 engaged performing other tasks.  
10

11 44. The apparatus according to claim 41, wherein the logic for filling is  
12 configured to proceed in a circular manner by wrapping around from an end of the cache  
13 memory to a beginning of the cache memory.  
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15 45. The apparatus according to claim 41, wherein the storage medium is an  
16 optical storage medium.  
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18 46. A computer readable medium including machine readable information for  
19 implementing the cache memory and each of the logic recited in claim 41.  
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